



The path to a cleaner, healthier environment starts with SunWatts™, a program designed to help customers of Arizona's Touchstone Energy® Co-ops take part in renewable electric generation technologies throughout Arizona.



a healthier planet.

The path to ...



## Table of Contents

What is SunWatts? .....	3
Frequently Asked Questions .....	4
PV Basics .....	6
SunWatts Contribution Program .....	8
SunWatts Incentive Program .....	10
On-grid systems .....	12
Off-grid systems .....	14

I, \_\_\_\_\_ (print name), hereby certify that I have read and reviewed the Incentive Program System Qualifications. I understand that I am solely responsible for ensuring that these qualifications are met and maintained for the life of my electric generating system and I am responsible for any consequences if they are not met. I understand they are needed for safe operation of my and Trico's electrical system. I also understand if they are not met, I am not eligible for any rebate from Trico and/or AEP/CO.

Contractor's Name: \_\_\_\_\_  
Contractor's Company: \_\_\_\_\_  
Contractor's Address: \_\_\_\_\_  
Contractor's Signature: \_\_\_\_\_  
Contractor's Lic. Number: \_\_\_\_\_  
System Description: \_\_\_\_\_  
System Location: \_\_\_\_\_  
Rated Output (in watts): \_\_\_\_\_  
Member's Name: \_\_\_\_\_  
Spouse's Name: \_\_\_\_\_  
Member's Address: \_\_\_\_\_  
Member's Signature: \_\_\_\_\_  
Spouse's Signature: \_\_\_\_\_  
Date: \_\_\_\_\_

## Incentive Program System Qualifications - Off-Grid

All **OFF-GRID** customer solar electric generating systems must meet the following system and installation requirements:

1. Energy source must be a permanently installed off grid (non-interconnected) Photovoltaic (PV) system.
2. Customer must be an existing Arizona cooperative member.
3. PV system must be on the customer's deeded or leased property that is within the Cooperatives service area.
4. System must be inspected once by the Utility to certify it is fully operational and meets all the qualifications of Part 1, 2 and 3. If multiple systems are installed then the Utility must certify all systems during a single site visit.
5. The rebate amount will be:

Rebate formula = (\$4.00)\*(PV Cell Nameplate Rating in watts)\*(Number of PV Cells)

6. The maximum rebate amount per customer is \$8,000 for residential installations and \$20,000 for commercial installations.
7. Rebate funds are on a first come, first serve basis and the rebate program will end when all funds have been rebated to customers.

## What is ...



are of our environment is a growing concern among electric cooperative customers. Many folks want a 'green' alternative for their energy needs. That's where the SunWatts™ program comes in.



exciting and growing renewable and photovoltaic (solar) movement in Arizona.

The SunWatts program has two parts:

- **The SunWatts Contribution Program**
- **The SunWatts Incentive Program**

Each of these programs is discussed in more detail in this handbook. You'll also find sign-up forms as well as the necessary NEC code and IEEE Standards information.

If you have any questions or need additional information, please contact Trico:



(520) 744-2944

## Frequently Asked Questions

### 1.) What is SunWatts™?

SunWatts™ is Trico's name for its renewable energy program. It includes the Contribution, Incentive and Large-Scale Renewable Generation Programs.

### 2.) Where does the SunWatts green power come from?

Renewable energy comes from many different sources including photovoltaic (solar) systems, wind and biomass.

### 3.) How can I enroll?

Residential and small business customers can choose from the Contribution or Incentive Programs.

The Contribution Program lets you contribute extra dollars on your bill each month. These dollars will be used for the installation and maintenance of renewable generation projects across Arizona.

The Rebate Program helps you defray the cost of installing a qualifying photovoltaic system in your home or business. Just fill out the proper enrollment form.

### 4.) I'm enrolled in the SunWatts Contribution Program. How will I know that green power is actually being provided to my home?

The renewable energy you're purchasing goes directly into our electric system and displaces our fossil fuel-fired generation. Your investment in renewable energy helps drive environmental responsibility. All co-op members benefit when even one member participates in SunWatts.

generation equipment.

6. The Customer System installation must meet the cooperative Service Requirements as follows:

"An AC disconnect means shall be provided on all ungrounded AC conductors and shall consist of a lockable gang-operated disconnect clearly indicating open or closed. The switch shall be inspected to determine that the switch is open. The switch shall be clearly labeled stating 'DG Service Disconnect.'"

7. All Customer System installations must be completed in a professional, workmanlike and safe manner.

8. The rebate amount will be:  $\text{Rebate formula} = (\$4.00) * (\text{PV Cell Nameplate Rating in watts}) * (\text{Number of PV Cells})$ . The maximum rebate amount per customer is \$4,000 for residential installation (up to 2,000 watts, or 2 kW) or \$20,000 for small commercial installations (up to 5,000 watts or 5 kW).

Contractor's Name: \_\_\_\_\_  
Contractor's Company: \_\_\_\_\_  
Contractor's Address: \_\_\_\_\_  
Contractor's Signature: \_\_\_\_\_  
Contractor's Lic. Number: \_\_\_\_\_  
Date: \_\_\_\_\_

Member's Name: \_\_\_\_\_  
Spouse's Name: \_\_\_\_\_  
Member's Address: \_\_\_\_\_  
Member's Signature: \_\_\_\_\_  
Spouse's Signature: \_\_\_\_\_  
Date: \_\_\_\_\_

# Incentive Program System Qualifications - On-Grid

All **ON-GRID customer solar electric generating systems** must meet the following system and installation requirements (e.g., systems to be connected to Trico's electric distribution system.

Please have your licensed contractor initial these eight items. Please submit this form to Trico PRIOR to installation.

\_\_\_\_1. The Customer System components must be certified as meeting the requirements of IEEE-929 - Recommended Practice for Utility Interface of Photovoltaic Systems.

\_\_\_\_2. The Customer System Components must be certified as meeting the requirements of UL-1741 - Power Conditioning Units for use in Residential Photovoltaic Power and be covered by a non-prorated manufacturers warranty of at least two years.

\_\_\_\_3. The Customer System design and installation must meet all requirements of the latest edition of the National Electrical Code (NEC), including Article 690 and all grounding, conductor, race-way, overcurrent protection, disconnect and labeling requirements.

\_\_\_\_4. The Customer System and installation must meet the requirements of all federal, state and local building codes and have been successfully inspected by the building official having jurisdiction. To do so, the installation must be completed in accordance with the requirements of the latest edition of the NEC in effect in the jurisdiction where the installation is being completed, including, without limitation, Sections 200-6, 210-6, 230-70, 240-3, 250-26, 250-50, 250-122, all of Article 690 pertaining to Solar Photovoltaic Systems, thereof, all as amended and superceded.

\_\_\_\_5. The Customer System must meet cooperative and Arizona Corporation Commission interconnection requirements for self-

**5.) How can I get more information about SunWatts?**  
Call Trico at (520) 744-2944 and speak with a member services representative to request information and enrollment forms.

**6.) Why is Trico selling green power?**  
Trico has a commitment to the community and to protecting our environment.  
With the SunWatts program, member-customers have an alternative to traditional fossil-fuel power sources, something from which we all benefit.

**7.) How are landfills used for energy?**  
Organic matter, such as that buried in landfills, breaks down to produce methane gas. Capturing and burning this gas enables the generation of electricity. By utilizing this energy, we reduce our need to burn non-renewable fossil fuels. In addition, this generation method prevents methane escaping into the atmosphere.

**8.) Why does green power cost more than other power?**  
Renewable energy is still not widely used and is more expensive than traditional sources. As technology improves, use increases and development costs are driven down. Thus, access to renewable fuels should become more economically attractive.

## PV Basics

Photovoltaic (PV) systems provide a flexible, 'green' option for customers looking for electric generation systems for their home or small business.

PV systems convert sunlight into electricity. You can find very simple PV cells in watches and calculators. Very complex systems can provide power to homes and even the electric grid.

### Applications

PV systems have a number of useful applications, particularly in sunny climates such as Arizona. PV systems can be used to supplement a homeowner's regular electric power and they can also be used in rural areas where it is cost prohibitive to run an electric transmission line to the customer's site or where only a small amount of electricity is needed, such as with water pumping.

### Off-grid and On-grid installations

PV systems can be installed either off-grid or on-grid. Off-grid installations refer to those systems that are standalone and are not connected to the Cooperative's electric system. On-grid, or grid-tied, installations are those that tie in directly with the Cooperative's electric grid.

### PV Considerations

PV systems do have some drawbacks. They cost more than traditional generation, generally about \$7 per installed watt depending on the nature and complexity of the system installed. As an example, a basic PV system for a residence can cost anywhere from \$12,000 to \$16,000, more if you wish to add storage systems such as batteries. Also, even though Arizona has an abundance of sun, the excessive temperatures in our desert climate can negatively affect the PV system's output. A licensed, reputable solar contractor can compensate for this degradation in the selection of the PV system. No two PV systems are exactly alike since no two installations have exactly the same needs. Much depends on the size of the home or business consuming the electricity and if there is a backup storage system, which have additional safety considerations. Only a licensed solar contractor can advise you as to the actual

ify for this energy buyback, net metering equipment will have to be installed. The cost of the net metering equipment can be included along with the other rebate materials. The rebate does NOT cover battery or backup systems.

(5) You, the owner of the system, are responsible for arranging for and payment of annual service inspections and normal system repairs to the unit, including labor.\*\*  
(6) In order to receive the rebate, you must submit the following to Trico:

- Certification by a licensed electrician or a Trico representative\*\* that the installed unit meets the qualifications as set out in the Incentive Program Systems Qualifications page.
  - The unit's rated output as specified by the manufacturer.
  - A signed Incentive Program Enrollment Form.
  - A signed Certification Form (available from Trico).
- Keep a copy for your records.**

(7) Once this proof is submitted to the cooperative, please allow eight weeks for your rebate to be processed.

\* Should you elect to have a Trico representative do the testing and certification of your system, you will be responsible for any trip charges as billed by Trico.

\*\* Trico strongly recommends that the customer, at the customer's sole cost and expense, obtain and maintain a liability insurance policy, providing liability insurance covering the PV system's generation activities and equipment. It's advised that this policy have a combined single limit coverage for injury or death to any person or persons and damage to any property of not less than \$1,000,000.

Rebate processing may take up to eight weeks. Trico reserves the right to refuse payment of a rebate based on the following reasons, including but not limited to: failure to meet the qualifications as set forth in the SunWatts Incentive Program System Qualifications, incomplete enrollment packets, insufficient system testing or certification, installation and/or testing/certification by an unlicensed electrician.



# Incentive Program

**S**olar power generators take the sun's rays and turn them into electric energy that can be used for everything from cooling your home in the summer-time to keeping you warm in the winter. And by using the sun's resources, we reduce our reliance on fossil fuel-fired electric generation, thus preserving our valuable natural resources.



With the SunWatts™ Incentive Program, you can be on the cutting edge of this exciting technology! Your co-op will pay you **\$4 per installed watt** — up to 2,000 watts for individual residential units, or up to 5,000 watts for small business/commercial units (up to 50% of the total cost of the unit, whichever is lower).

## The program is easy!

- (1) You must be a Trico member.
- (2) Select and install a qualifying solar electric system in your home or business. This home or business must be served by Trico. Furthermore, this system must meet all qualifications listed in the following on-grid and/or off-grid "Qualifications" section.
- (3) For grid-tied systems, you must have a licensed electrician or a representative from Trico\* test and certify that the system meets IEEE and the cooperative's interconnect standards (see 'Qualifications' section).
- (4) You sign an agreement assigning rights to the environmental credits to Trico. Trico will buy any excess electric generation output from the unit at its avoided cost rate. To qual-

costs of the system that is right for your needs.

### Components of a PV system

In a typical PV system, you will find a PV array and a control center containing a DC to AC inverter. Some people choose to add batteries to their system so they can store the unit's output and use it at night.

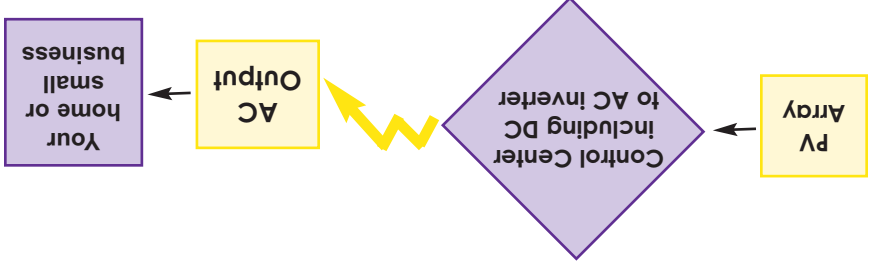
#### The PV Array

PV arrays collect the sun's rays and convert them into energy. There are a variety of PV arrays to choose from. Some are fixed; that is, they do not move or track the sun throughout the day. Some are tracking units that actually move with the sun as it moves across the sky during the day or throughout the season. Some are mounted at ground level where others are mounted on buildings or elevated structures.

It's important that the PV array be designed to meet wind load requirements of the area. An improperly installed PV system could be destroyed in a wind storm, therefore wind load is important. Wind load depends on the size of the array and the tilt angle of the array. A licensed solar contractor can assist with determining wind load. PV arrays generally have an expected life of 15 to 20 years.

#### The Control Center

Electronic controllers, inverters and any necessary switches, fuses and additional components can be found in the Control Center. These components should be able to withstand high temperatures and weather, as well as carry the proper certifications. Below is a simple illustration of a basic PV system. An actual system may have more components depending on whether the customer wishes to connect to the grid, in which case safety mechanisms must be installed. A customer may also wish to add a battery system for nighttime power, which has safety and interconnect requirements. Your licensed solar contractor can assist you in determining what will work best for you.



# Contribution Program

## Ensure A Bright Future for Planet Earth With SunWatts!



Sunshine - it's one of Arizona's most abundant resources. And, with your help, Trico is harnessing the sun's enormous power and turning it into clean, green power.

Solar power generators take the sun's rays and turn them into electric energy that can cool your home in the summer and keep you warm in the winter. And by using the sun's resources, we reduce our reliance on fossil fuel-fired electric generation, thus preserving our valuable natural resources.

With the SunWatts™ Contribution Program, you can help foster this constantly evolving, exciting technology. You choose the amount you wish to contribute, which will appear as a line item on your monthly bill. These extra dollars will go directly to the installation and maintenance of solar-powered and other renewable generation throughout Arizona. **Your contribution is voluntary and you can opt out at any time - just notify Trico.**

To enroll, just fill out the form below and enclose it with your bill or drop it by the office. Your enrollment will take effect in your next billing cycle.

YES! I want to enroll in Trico's SunWatts Contribution Program! By enrolling, I will make a monthly contribution to Trico's green energy programs.

Amount I wish to contribute each month (please check ONE):

- |                                 |                                  |
|---------------------------------|----------------------------------|
| <input type="checkbox"/> \$2.00 | <input type="checkbox"/> \$7.00  |
| <input type="checkbox"/> \$3.00 | <input type="checkbox"/> \$8.00  |
| <input type="checkbox"/> \$4.00 | <input type="checkbox"/> \$9.00  |
| <input type="checkbox"/> \$5.00 | <input type="checkbox"/> \$10.00 |
| <input type="checkbox"/> \$6.00 |                                  |

Please print:

Name: \_\_\_\_\_  
 Account Number: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 Phone: (\_\_\_\_) \_\_\_\_\_  
 Signature: \_\_\_\_\_  
 Date: \_\_\_\_\_

The amount you check will appear as a line item on your bill. Your enrollment will be reflected on your next bill. Contributions are voluntary and you may opt out at any time. You must notify Trico in writing that you wish to opt out. It may take a full billing cycle for the change to appear on your bill.